

ROBERT BOSCH AUSTRALIA  
PTY LTD

PRODUCTIVITY COMMISSION  
SUBMISSION

10 MAY, 2002

**BOSCH**



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
1.1. COMPANY STRUCTURE.....	7
1.2. THE BOSCH GROUP’S AUTOMOTIVE BUSINESS UNITS.....	8
1.3. SALES OF AUTOMOTIVE PRODUCTS AND TECHNOLOGY.....	10
1.4. EXPORT MARKETS FOR RBAU’S AUTOMOTIVE PRODUCTS.....	11
1.5. EMPLOYMENT AND SKILLS DEVELOPMENT AT RBAU.....	16
1.6. INNOVATION AND R&D CAPABILITY.....	18
1.7. CAPITAL INVESTMENT IN AUTOMOTIVE COMPONENT PRODUCTION.....	19
1.8. SUPPLY CHAIN DEVELOPMENT AND TECHNOLOGY TRANSFER.....	21
1.9. RBAU’S CONTRIBUTION TO THE AUSTRALIAN ECONOMY.....	22
1.10. BUSINESS AWARDS FOR RBAU.....	23
1.11. FUTURE DIRECTIONS FOR RBAU.....	23
<b>SECTION 2 – RBAU’S OPERATING ENVIRONMENT</b> .....	<b>28</b>
2.1 GLOBAL CHANGES IN THE AUTOMOTIVE INDUSTRY.....	28
2.2 RBAU’S RESPONSE TO THE ACIS PROGRAM.....	29
2.3 THE ROLE OF THE AUTOMOTIVE TARIFF.....	33
2.4 DECLINE IN THE AUTOMOTIVE TARIFF RATE.....	33
2.5 OVERSEAS MARKET ACCESS ISSUES.....	35
2.6 OTHER REFORMS.....	36
<b>SECTION 3 – RECOMMENDATIONS</b> .....	<b>39</b>
<b>APPENDIX A - KEY HISTORICAL MILESTONES FOR BOSCH IN AUSTRALIA</b> .....	<b>40</b>
<b>APPENDIX B – INFLUENCES ON DOMESTIC DEMAND AND THEIR LIKELY IMPACT</b> .....	<b>42</b>
<b>APPENDIX C – METHODOLOGY &amp; ASSUMPTIONS</b> .....	<b>44</b>

Tables

Table 1	Product Range and Functions Performed	9
Table 2	Components, Customers and Export Locations	12
Table 3	Project-Specific ACIS Impact	31

Charts

Chart 1	Distribution of RBAU Sales by Business Sectors, 2001	11
Chart 2	RBAU Automotive Export Sales, 1991-2001	13
Chart 3	Automotive Employment by Qualification, 2002	17
Chart 4	Annual R&D Expenditure, 1992-2001	19
Chart 5	Buildings, Plant and Equipment Expenditure, 1999-2001	20
Chart 6	Investing for the Future	25
Chart 7	Automotive Tariff levels across selected countries, 2002	34

## EXECUTIVE SUMMARY

***With policy settings for the post 2005 period that continue to reward expenditure in research and development and attract new investments by the component sector of the Australian automotive industry in productive assets, Robert Bosch Australia has the potential to generate \$1.5 billion in turnover by 2010, of which \$800 million could be generated through export sales.***

***The story of the growth to date, the global integration of Robert Bosch Australia and the potential for the future, are representative of what can be achieved by local automotive companies with a vision and supportive policies.***

### *Overview*

The Robert Bosch Group is a major global producer of automotive components and systems. Robert Bosch Australia (RBAU) performs design, development, applications engineering and manufacture of high-tech automotive components and systems for both original equipment and aftermarket customers. RBAU employs nearly 1,900 people, with sales of \$754 million, of which \$321 million are automotive original equipment exports.

RBAU has attained a strategic position within the global Bosch Group. The company continues to expand its customer base across a range of countries, and has developed into a globally competitive first tier supplier through:

- Utilising the Robert Bosch Group's global networks;
- Excellence in design, development and manufacture;
- Innovation in product and process technology;
- The development of export markets for a range of products and services;
- The employment and training of a dedicated workforce; and
- A competitive public policy framework in Australia.

### *A changing global industry*

The international automotive industry is experiencing a period of radical change. Minimum scale volumes to support viable production in the global industry are increasing, and being driven by:

- Consolidation of the Automotive Industry;
- The move to global platforms;

### *Policy responses*

RBAU needs a supportive, stable and well-targeted government policy setting in order to respond successfully to these challenges.

### *ACIS*

The Automotive Competitiveness and Investment Scheme (ACIS) has been important to directing the Australian Automotive industry towards more innovative, internationally competitive practices. RBAU has been reinvesting its ACIS benefits in the future of the company through research and development, plant & equipment, and training and education – three absolute pre-requisites to future industry success. The combination of ACIS and a supportive tariff rate are vital to the RBAU case for gaining approvals for further projects in Australia.

### *The automotive Tariff rate*

The current tariff rate assists the business case that RBAU puts to its parent company in seeking new project activity. Once secured, these projects can lead to further growth and export opportunities, but their initial location in Australia is dependent upon the existence of the tariff to compensate for Australia's small domestic market volume and its remoteness from major overseas automotive markets.

The planned tariff rate of 10% for Australia in 2005 will be low by world standards. The rate needs to be stabilised until other countries offer trade access concessions to Australia, to ensure that the location of new projects in the country continues.

#### *Market access*

Opening new export markets offers substantial opportunities for the Australian automotive industry. With locally produced vehicles now comprising less than 40% of domestic new vehicle sales, there are a range of countries with which Australia has a substantial automotive trade imbalance. Thailand is a key example. Progress in opening these markets could provide a substantial boost for the local industry.

#### *Industrial relations*

There are some challenges facing the automotive industry in the industrial relations arena that will require a tripartite response from government, unions and the industry.

#### *The policy settings for the future*

RBAU, and the Australian industry as a whole have made significant gains since 1996. Exports have grown significantly, the research and development and investment base has been enhanced, and the quality of the components and vehicles produced here has improved.

The right policy environment for 2005-2010 will see Australia's position in the world automotive industry become more entrenched.

## SECTION 1 –AUTOMOTIVE PROFILE OF ROBERT BOSCH AUSTRALIA

### 1.1. Company Structure

#### *Robert Bosch in Australia*

Robert Bosch (Australia) Pty Ltd (“RBAU”) is a wholly owned subsidiary of Robert Bosch GmbH, Germany (“RB”). RBAU was one of the first automotive component companies to establish a manufacturing presence in Australia in 1954. The company has continually replaced imported RB products with locally manufactured components once the domestic market made local production viable. Appendix A provides an overview of the key historical milestones for RBAU and RB globally, while the table below gives statistical milestones for RBAU.

#### **RBAU Statistical Milestones 1995 - 2001**

Sales	from \$ 386m to 754m
Automotive OE Exports	from \$ 40m to 321m
Capital Investments	cumulative \$ 220m
R & D Expenditure	> \$ 150m
Employment	from ~1300 to ~2000
Engineers	300 in 2001 (>150 R & D)

RBAU locally designs, develops and produces a range of automotive components. It distributes locally made and imported automotive products to original equipment and aftermarket customers in Australia and overseas. Additionally, RBAU has the regional responsibility for development of automotive original equipment business in ASEAN countries on behalf of RB. While automotive sales account for approximately 82% of total RBAU turnover, RBAU also supplies and distributes power tools, household appliances and gas hot water systems.

RBAU operates an automotive service dealer network around Australia and New Zealand totalling 485 dealerships that support the aftermarket activity of the company. These dealerships provide customer access to skilled automotive service professionals who intimately know the Bosch product line.

*Robert Bosch Globally*

The RBAU operation is part of an expansive RB global network comprising 118 manufacturing locations established in all the major motor vehicle manufacturing countries of the world, including North and South America, Germany, France, Italy, China, Japan and Korea. RBAU accounted for 1.3% of total turnover of RB in year 2001.

## **1.2. The Bosch Group's Automotive Business Units**

The Automotive Technology Business Sector of the Bosch Group comprises 8 Product Divisions, each being responsible for the global coordination of product development, manufacturing and marketing activities in their respective business areas. These Product Divisions are:

- **Gasoline systems ("GS");**
- Diesel systems ("DS");
- **Chassis systems ("CS");**
- Energy systems ("ES");
- **Body electronics ("BE");**
- Car Multimedia (as Blaupunkt) ("CM");
- **Automotive Electronics ("AE");**
- **Automotive Aftermarket ("AA");**



Divisions highlighted in bold represent areas where RBAU is active in engineering and manufacturing in global partnership with RB. These same Divisions represent the greatest potential for the future growth of RBAU.

*RBAU's Automotive Capabilities in Engineering and Manufacturing*

The Automotive Business Sector is the lifeblood of Bosch's Australian operations, accounting for 82% of RBAU sales. The following table focuses on the key areas of RBAU's capabilities in the automotive original equipment sector:

*Table 1 – Product Range and Technical Functions Performed*

<b>System/component</b>	<b>Functions performed</b>
<i>Vehicle stabilization</i>	<i>Applications engineering, Manufacture</i>
<i>Gasoline engine management &amp; fuel injection</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Transmission management</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Engine cooling</i>	<i>Applications engineering, Manufacture</i>
<i>Body electronics</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Climate control</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Locking and access control</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Parkpilot</i>	<i>Applications engineering</i>
<i>Car radios and accessories</i>	<i>Applications engineering</i>
<i>Vehicle navigation and telematics</i>	<i>Applications engineering</i>
<i>Energy supply, Starters, Alternators</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Semiconductors, Electronic Control Units</i>	<i>Development, Applications engineering, Manufacture</i>
<i>Sensors</i>	<i>Development, Applications engineering, Manufacture</i>

This table highlights the variety of technical functions that are performed at RBAU from development through to manufacture.

The RBAU experience involves a history of ever changing product mix, transition to higher value added activities and a proactive stance in relation to global automotive change. This experience reflects the pressures and catalysts for change facing the Australian automotive industry as a whole.

Development, applications engineering and manufacturing are amongst the range of functions performed in the company that are constantly evolving to

keep up with the pace of market change. RBAU believes this innovation in product range and technical capability is a fundamental pre-requisite to on-going success in the automotive sector globally.

#### **RBAU achieves world first**

In 1996, RBAU was the first operation within the Bosch Group outside of Germany to be afforded worldwide product responsibility, this being in the area of Body Electronics.

This status is a testament to the ability of Australia to lead the world in the areas of high-value added design, and to attain world scale volumes in manufacture.

In winning this status, the R&D focus of industry assistance through current programs such as ACIS, and past programs such as the Export Facilitation Scheme assisted in matching government incentives offered by other countries. Such assistance highlights the Australian Government's vision for the local automotive industry to the RB global decision-makers. This provides confidence to support decisions to locate substantial activity in Australia.

This status has now evolved into RBAU being the lead product development and manufacturing plant for aspects of the body electronics product range. An example of a high volume project arising from this global integration and responsibility is the door electronic module manufactured for Volkswagen and exported in volumes exceeding two million units per annum.

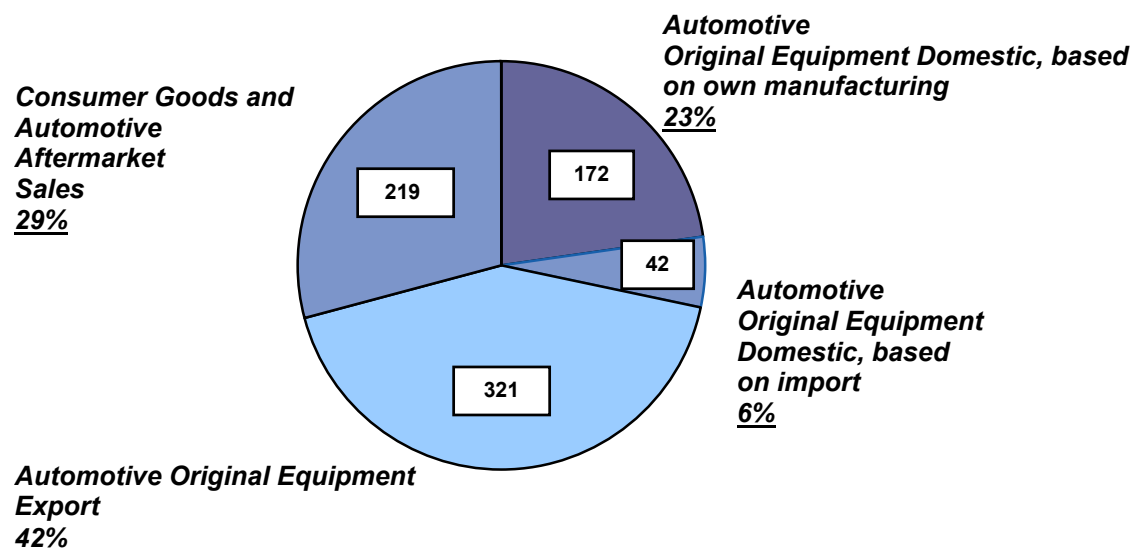
### **1.3. Sales of Automotive Products and Technology**

In 2001, RBAU had a turnover of \$754 million, of which \$622 million was attributable to its automotive business. Approximately \$580 million of the company's turnover is derived from locally manufactured automotive products.

#### *Composition of sales*

The following chart highlights the composition of RBAU's sales:

Chart 1 – Distribution of RBAU Sales by Business Sectors, 2001 (\$M in boxes)



Despite the penetration that RBAU has achieved into international markets, the company's continued presence in Australia is founded on a substantial domestic vehicle assembler base. The interdependence of domestic and export activities is further elaborated in Section 2.3.

#### 1.4. Export Markets for RBAU's Automotive Products

RBAU has a mature export business. Exports have risen markedly since the early 1990s when only 1.8% of company turnover was derived from export sales. In 1995, company exports totalled \$40 million. This has increased to \$321 million in 2001, with exports now comprising over 40% of total company sales and 60% of original equipment sales. The company exports components for gasoline systems, chassis systems, body electronics, automotive electronics and a range of automotive engineering services. 80% of RBAU's exports are sent to Europe, 12% to various Asian countries and 8% to the United States.

RBAU has amassed a variety of automotive technologies, customers and locations that it sells to globally.

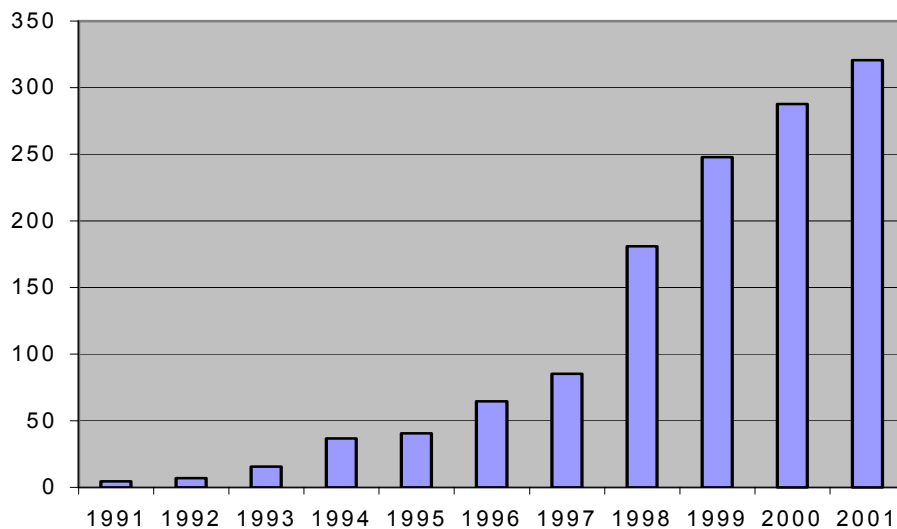
*Table 2 – Examples of Components, Customers and Export Locations*

<b>System/component</b>	<b>Customer</b>	<b>Location</b>
<i>Chassis systems</i>		
	<i>GM-Opel</i>	<i>Germany</i>
	<i>PSA</i>	<i>France</i>
	<i>Toyota</i>	<i>Japan</i>
	<i>Daimler Chrysler</i>	<i>Germany</i>
	<i>Porsche</i>	<i>Germany</i>
	<i>Saab</i>	<i>Sweden</i>
	<i>Volvo</i>	<i>Sweden</i>
<i>Body electronics</i>		
	<i>HDMC</i>	<i>China</i>
	<i>Hafei</i>	<i>China</i>
	<i>Hyundai</i>	<i>Korea</i>
	<i>Kia</i>	<i>Korea</i>
	<i>Iveco</i>	<i>Italy</i>
	<i>Fiat</i>	<i>Italy</i>
	<i>Nedcar</i>	<i>Holland</i>
	<i>Volvo</i>	<i>Sweden</i>
	<i>Porsche</i>	<i>Germany</i>
	<i>Audi</i>	<i>Germany</i>
	<i>Ferrari</i>	<i>Italy</i>
	<i>GM-Opel</i>	<i>Germany</i>
	<i>Volkswagen</i>	<i>Germany</i>
<i>Automotive Electronics</i>	<i>Robert Bosch</i>	<i>Germany</i>
<i>Engineering services</i>	<i>Robert Bosch</i>	<i>Germany</i>

*Recent export growth*

The extraordinary growth in exports during the last ten years to \$A321million in 2001, is depicted on the following chart.

*Chart 2 - RBAU Automotive Export sales, 1991-2001, (\$M)*



The export success illustrated above has been built upon the base of RBAU's business in the Australian domestic market. RBAU owes its existence to this base. It has capitalised on the technologies and expertise in design and manufacture that has evolved from local sales to aggressively attack the international marketplace.

### *The drivers of export success*

A number of factors have contributed to the on-going export successes of RBAU. These include:

- The extensive global networks of the parent Bosch Group

The number of product mandates afforded the Australian operation by RB is a result of economic performance, proven quality, engineering and manufacturing capability, time to market issues, and importantly, public policy settings.

The Australian Government's policy stance toward the local industry impacts RB decisions in two important respects:

1. Its financial support enhances RBAU's business case when bidding for new investment and R&D projects against competing locations. This support directly addresses the two major disadvantages of Australia in the global competition for investments, namely, its small domestic market size and its remoteness from the high-volume automotive markets.
2. It confirms the Australian Government's commitment to the automotive industry.

- The development of critical mass

Given the relatively small size of the Australian automotive market the creation of truly global volume production in any product area is quite rare. RBAU has achieved this through exports in the areas of body electronics, diodes and steering wheel angle sensors, and plans to reach this status with Vehicle Stabilisation Systems. This creates opportunities to reduce manufacturing cost through purchasing and process rationalisation.

- On-going activity in specific product areas  
RBAU's manufacturing for export is based on its local design and development of successive generations of certain products (e.g. Body Electronics). This "virtuous cycle" has created momentum within RBAU in these product areas, with product and manufacturing process development being the keys that have helped ensure continuity and growth in its export business.
- Seeking excellence in manufacturing  
The development and maintenance of a world standard manufacturing capability is a key element of sustained export success. RBAU's commitment to this is illustrated through our focus on:
  - upgrading and renewing plant and equipment;
  - continually investing in R&D to support the manufacturing process; and
  - ensuring that the skills base within the organisation are up to the task.

### *The RBAU Export Imperative*

RBAU sees exports as the on-going support base for growing an Australian automotive business. Export is the key to attaining global volumes, and consequently to enjoying the cost reductions available through scale production. Additionally, competing on the international stage provides an excellent discipline in ensuring that both product and process technology and quality are at the highest level, and in understanding first hand the trends and directions of the industry.

The currency of this imperative is displayed through the continual refinement of the product mix that is selected for local manufacturing.

Section 1.11 considers the potential future export opportunities that RBAU is currently exploring.

## 1.5. Employment and Skills Development at RBAU

Nearly 1,900 people from over 70 nationalities are employed by RBAU, of which approximately 1,700 are dedicated to automotive activities. RBAU has in-house training facilities to broaden employee skills and to retain and develop its employees. It encourages external training and self-education at all levels and job classifications. \$4 million was invested in training and education in 2001. RBAU employs over 300 engineers, of which over 150 are dedicated to research and development (R&D) activities.

### *Employment categories*

Of RBAU's automotive employees, 582 are degree-qualified engineers or have other tertiary qualifications. The remainder also incorporates a number of trade-qualified personnel and apprentices.

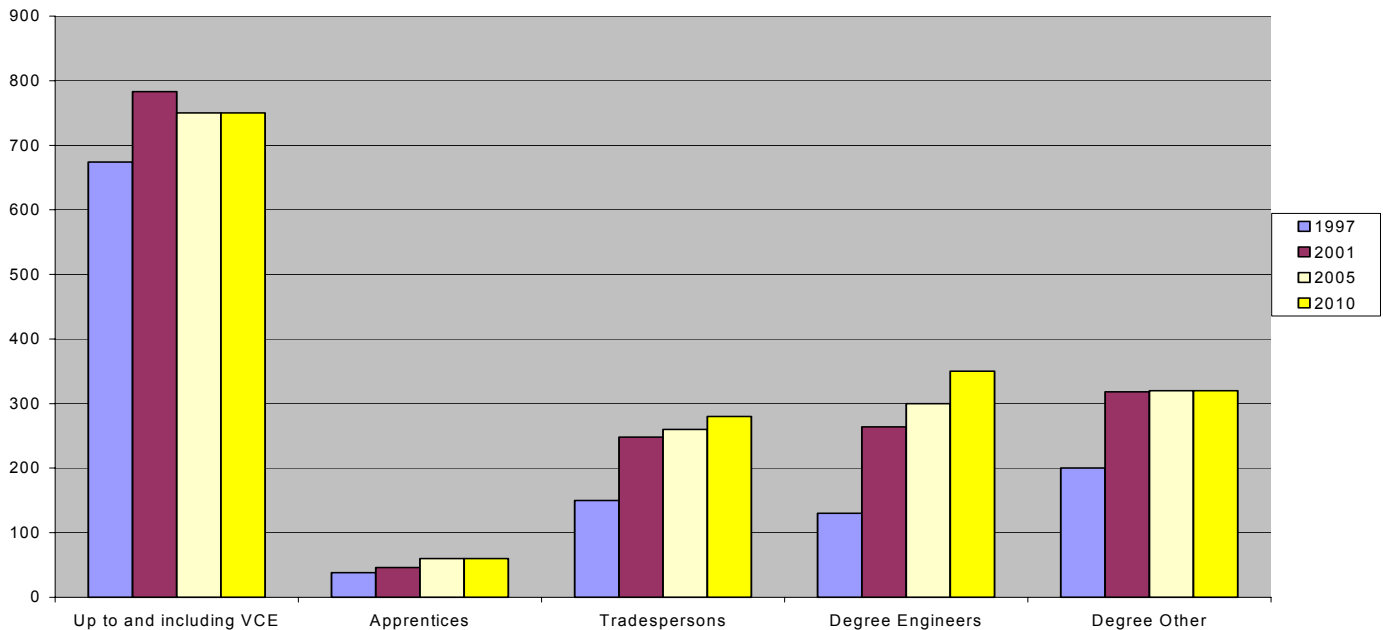
At present, approximately 10% of RBAU's degree-qualified employees hold a second or higher degree. It is anticipated that this proportion may increase to 15% by 2010, assuming the upskilling of people that will be required for the company to realise its growth potential (refer Section 1.11, sub-heading Business projections and the public policy environment, p.28).

RBAU has established itself as a Registered Training Provider, with the status of a TAFE college to provide training courses. RBAU continues its long established tradition of facilitating apprenticeships.

Extending on this training philosophy, RBAU has developed a course in cooperation with RMIT, which provides for the transition of trade-qualified people to become degree-qualified engineers.



Chart 3: Automotive Employment by Qualification, 2002



*Skills development and training, links to educational institutions*

This highly qualified workforce is a vital prerequisite for RBAU’s success as a global automotive supplier.

Additionally, the company’s focus on higher degrees, including Masters and PhD qualifications has helped to lessen Australia’s brain drain and add significantly to the local skills base.

A significant shift towards the development of advanced production techniques requires the upskilling of trade qualified people to support and control new manufacturing processes necessary for future development. This has resulted in RBAU identifying a gap in Australia’s training and education infrastructure. There is a substantial shortfall in technical skills between base trade and tertiary engineering qualifications needed to raise the utilisation of investments in complex manufacturing processes to international standards. RBAU has acted to bridge the gap by working collaboratively with universities and other training institutions in Australia. The company has relationships with higher education institutions to develop industry-relevant curricula.

**RBAU / RMIT collaboration**

RBAU collaborates extensively with RMIT to develop courses that transition trade qualified people to degree-qualified engineers.

This upgrading of skills supports RBAU's focus on high technology manufacturing processes epitomised by the following example:

RBAU has secured sole responsibility for global production of Torque and Angle Sensors used in Steer-by-Wire Systems. This product requires entirely new manufacturing processes that are presently being developed for installation in a controlled manufacturing environment at RBAU. This work, and the associated staff training (to which the RMIT connection will be an important contributor) are being undertaken now.

**1.6. Innovation and R&D Capability**

RBAU is a leading innovator in Australian automotive technology through its commitment to research and development, including pioneering work in the field of electronics. This focus impacts on both product and process technologies.

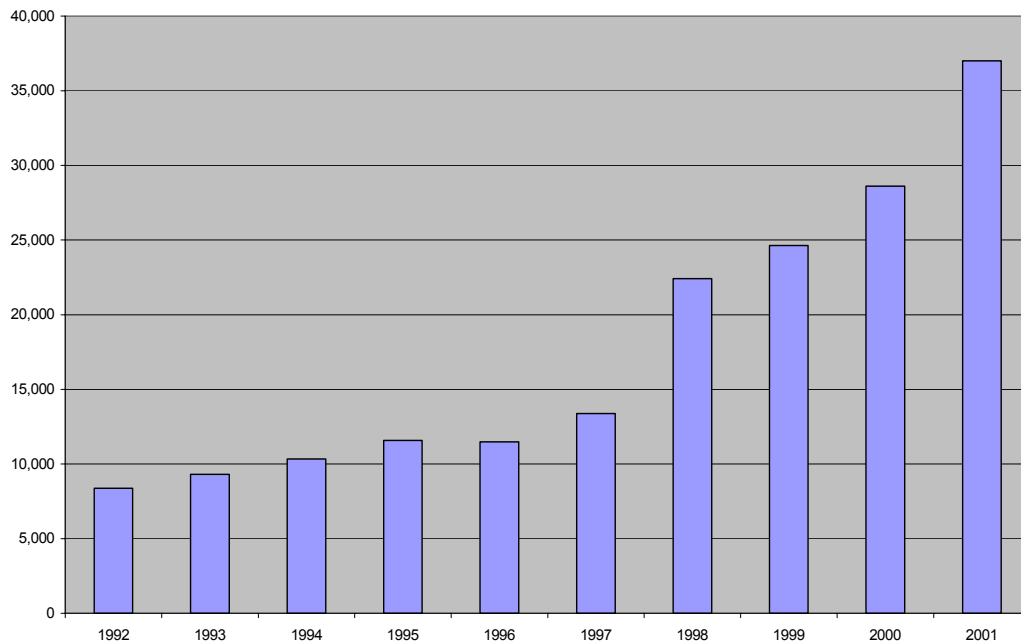
RBAU's leadership and commitment to excellence have gained it a lead role within the Bosch Group for the development and manufacture of automotive on-board electronics. RBAU has spent in excess of \$150 million<sup>1</sup> in research and development during the five-year period to 2001.

---

<sup>1</sup> This is using the definition of research and development outlined in Australian taxation legislation.

---

Chart 4: Annual R&D Expenditure, 1992-2001, (\$000s)<sup>2</sup>



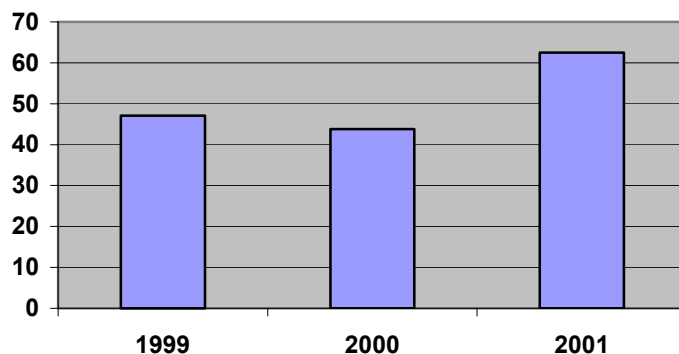
The Export Facilitation Scheme and ACIS, in particular, have supported the maintenance of these high expenditure levels. This support is critical given that a substantial capability for innovation is a prerequisite to participating in the global automotive market and the establishment of such a capability cannot be financed by Australia's domestic market alone. The long investment periods associated with this type of R&D is a further inhibiting factor. As an example, initial research and development of the "passive entry/passive go" product began in early 1997. This product will not go into series production until end of 2002.

### 1.7. Capital Investment in Automotive Component Production

From 1995 to 2001, RBAU cumulatively spent over \$220 million on capital investments, with \$62 million invested in 2001 alone. These investments were undertaken to ensure RBAU's future viability.

<sup>2</sup> This chart utilises the Australian taxation legislation definition of R&D.

Chart 5 – Buildings, Plant and Equipment Expenditure, 1999-2001, (\$M)



Considering another measure, the RBAU spend on plant and equipment in proportion to the amount of product manufactured locally also continues to rise.

One of RBAU's largest recent investments has been in the highly specialised plant and equipment for production of silicon chips used in power diodes for motor vehicle alternators. This deepens RBAU's local content in diode manufacture and gives it self-sufficiency to supply a major part of the world diode market from Australia.

ACIS support for investment in plant and equipment has made it possible for RBAU to continually upgrade its manufacturing processes, introduce leading edge technology to Australia and secure its future position as a global component supplier.

## 1.8. Supply Chain Development and Technology Transfer

### *Skills/Technology and the Supply Chain*

RBAU's position as a key technology provider has a substantial flow-on effect to the broader Australian industry.

With access to leading automotive engineers around the globe and in Australia, RBAU is well placed to contribute to the development and transfer of cutting-edge thought and technology throughout the automotive supply chain in Australia.

#### **RBAU AND SUPPLIER COLLABORATION**

There are numerous examples of the positive flow-on effects that accrue to the RBAU supplier base. These benefits arise in a range of areas, including technology upgrades, and import replacement.

##### *Mett Diecasting*

Mett purchased in-line shot blasting equipment to support RBAU's export of machined throttle body housings to RB Germany. This equipment is the only one of its type in Australia, and has effectively upgraded the operations, capability and skills base of the Mett organisation.

##### Hook Plastics

The third generation of the Steering Wheel Angle Sensor manufactured by RBAU was the subject of a substantial import replacement exercise. Australian company, Hook Plastics, was awarded the contract to supply 40% of the mechanical parts for the product, replacing inputs previously imported from Germany. Hook has maintained this supply arrangement for subsequent variants of the Sensor.

### *Simultaneous Engineering*

RBAU works in close partnerships with suppliers to share knowledge, build skills and develop new technologies in product development. Simultaneous Engineering (“SE”) is practiced within RBAU and RB and is one example of the type of cooperative effort to effect skills and technology development and transfer.

In a supplier context SE means establishing cross-functional teams, with representation from RBAU and suppliers that manage a project from the concept stage all the way to a successful start of production. This encourages the active sharing of technical concepts and revolutionary ideas to expand the base of engineering expertise at RBAU and our suppliers. Constructive, cooperative SE can serve to optimise product development to the benefit of suppliers and OEMs by reducing the time required to take an idea from concept to series production and to optimise the cost structure of the product.

## **1.9. RBAU’s Contribution to the Australian Economy**

### *The RBAU Contribution and ACIS*

RBAU is a major contributor to the Australian economy as indicated by its direct employment, supply chain linkages, and export activity. The company has commissioned Deloitte Touche Tohmatsu to undertake an Impact Study to assess the specific contribution made by RBAU as a company.<sup>3</sup>

This study found that RBAU’s contribution to economic activity, including multiplier effects generated in the wider economy as a result of RBAU’s activities, was \$768 million in 2001.

Additionally, the study considered the contribution of the ACIS initiative to this figure. It concluded that the ACIS-related component of the RBAU contribution was \$184 million. This means approximately 24% of the total

economic benefit generated by Bosch's activities results from ACIS-induced expenditure.

#### **1.10. Business Awards for RBAU**

RBAU has been consistently recognised for its commitment and contribution to local investment and development of cutting-edge technology. Awards marking significant accomplishments of RBAU have included:

- 1999, 2000 & 2001 winner of Governor of Victoria Awards in the category "Large Advanced Manufacturer";
- 1999 & 2000 Victorian Exporter of the Year;
- 1999 & 2000 Australian Exporter of the Year;
- 2000 Silver Award from Australian Automotive Aftermarket Association for Excellence in Manufacturing;
- 1998 Business Review Weekly ("BRW") magazine's Top 10 most innovative companies in Australia listing; and
- 1995 Victorian Employer of the Year.

#### **1.11. Future Directions for RBAU**

##### *Business Outlook*

RBAU provided a submission to the Productivity Commission's automotive inquiry in 1996 in which it forecast that its export revenue would reach \$400 million by 2005. With automotive original equipment exports amounting to \$321 million in 2001, this target is likely to be surpassed.

RBAU is now in a position to forecast its turnover and export activity levels out to 2010. In 2005, total automotive OE turnover has potential to reach \$1 billion with the export component \$600 million. Assuming a continuation of government assistance for the automotive industry that is directed at research and development and capital expenditure, by 2010 RBAU foresees the

---

<sup>3</sup> This study utilised ABS input-output tables to assess the contribution made by RBAU, then isolated the ACIS-driven component of this figure. Refer Appendix C – Methodology & Assumptions

potential to increase these figures to \$1.5 billion and \$800 million, respectively.

These projections assume that a 10% tariff will remain in place until 2010 and a similar initiative to the current ACIS program for component manufacturers will apply from 2006 to 2010.

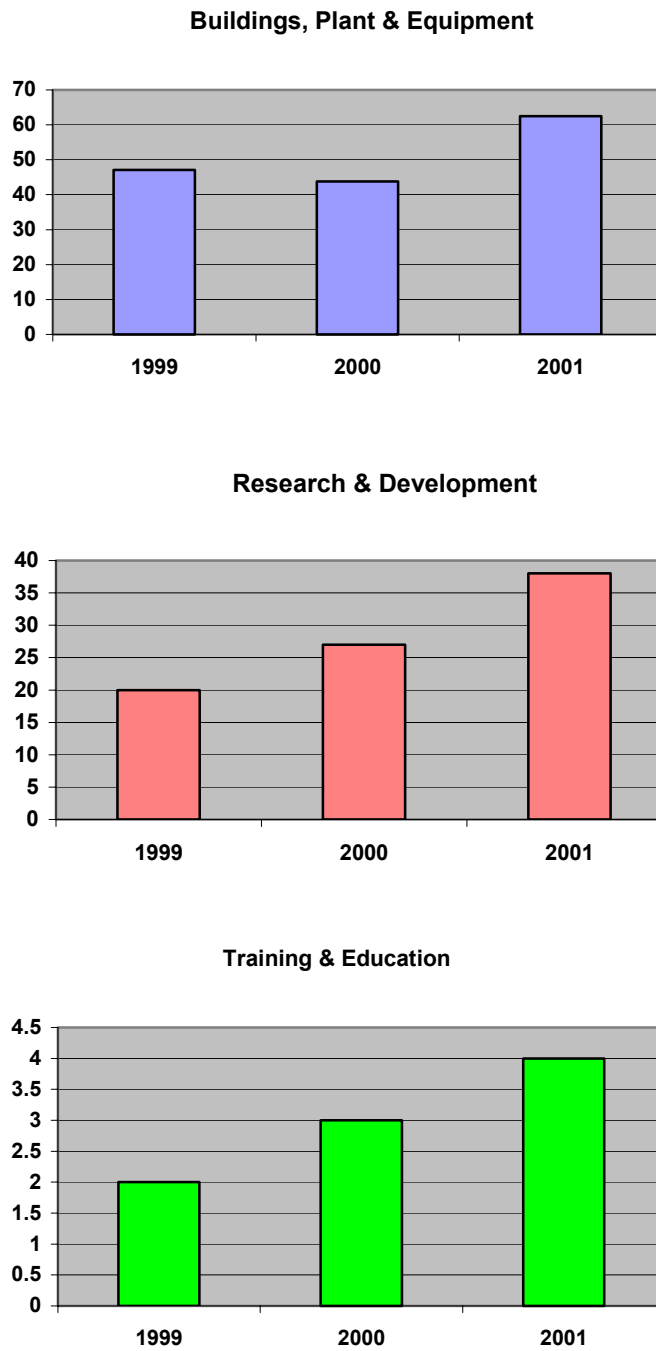
*The Critical success factors*

Observing and understanding global automotive trends is the key to future prosperity within the industry. Responding to these opportunities through expenditure on research and development, investment in plant and equipment, and a commitment to training and education is the key to capitalising on them.

With the assistance of the ACIS program, RBAU has been able to commit ever-increasing funding to these three areas that are critical for growth. ACIS is also an example of the Australian Government competing with its international counterparts.



Chart 6 – Investing for the Future<sup>4</sup> (\$M)



<sup>4</sup> For Research and Development, definition as per Australian taxation legislation is used.

RBAU views the Australian policy setting in its totality, taking into account a range of factors including:

- Market access;
- Economic and fiscal policy;
- Tariff settings;
- Industry assistance;
- Investment attraction incentives; and
- Labour market and industrial relations system.

There are some key requirements that must be met to ensure that RBAU continues to meet its challenges. Some of these are within the control of Bosch, others are market driven, and some are within the purview of the Government.

- An ongoing commitment to:
  - Expanding the R&D effort;
  - Upgrading plant and equipment; and
  - Continual training and recruitment of world class engineers and designers;
- Increasing the involvement of the Australian research community and educational institutions in longer term projects;
- Encouraging the involvement of Australia's best students in automotive careers;
- Ensuring our public policy base is competitive with the rest of the world, particularly incorporating:
  - Market access issues;
  - Investment incentives; and
  - Industry assistance.

RBAU is committed to meeting its obligations to ensure the parameters for success are achieved. Obviously, the public policy area is the responsibility of Federal and State governments.

***Key themes:***

***In its 48 years of manufacturing in Australia, RBAU has developed into a globally competitive first tier automotive supplier. This position has been achieved on the basis of:***

- ***Innovation in product and process technology;***
- ***Excellence in design, development and manufacture;***
- ***Positive collaboration with the company's supplier base to enhance their technical capabilities and quality;***
- ***The development of export markets for a range of products and services;***
- ***The employment and training of a dedicated workforce; and***
- ***A competitive public policy framework in Australia.***

***RBAU is committed to its Australian presence, and believes that with the right policy environment, it will continue to grow its investment, employment and export base.***

## SECTION 2 – RBAU’S OPERATING ENVIRONMENT

### 2.1 Global changes in the automotive industry

The late nineties and early part of this century have seen change in the structure of the global automotive industry continue unabated. This is characterised by:

- Concentration of OEM ownership and the move to global platforms. Increasingly, a smaller number of independent vehicle assemblers are manufacturing product based on a uniform model or “platform”. While model variants that reach the market may continue to expand based on differentiating engine sizes and attributes, features and accessories, the main impact of the push to global platforms is that the volumes sought in component contracts are becoming substantially larger.
- The devolution of responsibilities to the first tier. Reduction in the number of first tier players has seen the remainder take on a range of extra responsibilities in the areas of module assembly, systems integration and supply, and the management of suppliers further up the supply chain.
- The electronics and information revolutions. The trend toward increased electronics and related equipment as a proportion of vehicle value will continue. By 2005, 22% of a car’s production value will be related to electronics, compared to 11.5% in 1995.<sup>5</sup>

---

<sup>5</sup> Source: Robert Bosch GmbH research.

## 2.2 RBAU's Response to the ACIS Program

### *The structure of ACIS benefits for MVP's and ACP's*

Motor Vehicle Producers (MVP's) receive their main ACIS benefits in the form of:

- Production credits at the rate of 25% of the relevant tariff rate multiplied by the value of vehicle production (15% of which is uncapped, 10% of which is capped);
- Investment credits at the rate of 10% or 25% of eligible investments in plant and equipment (capped); and
- 45% of eligible expenditure on R&D other than for own use.

Automotive Component Producers (ACP's) receive their ACIS benefits in the form of:

- R&D credits at the rate of 45% of eligible expenditure on R&D (capped); and
- Investment credits at the rate of 25% of eligible investments in plant and equipment (capped).

ACP's are precluded from receiving production credits for the components they produce. MVP's are precluded from receiving ACIS benefits for R&D expenditure incurred in the design and production of their own vehicles because such expenditure forms part of the production value of the vehicle, for which they receive production credits. The differential rate between MVP's and ACP's for investment in plant and equipment exists because production credits are considered to be the primary benefit stream accruing to MVP's under ACIS.

*Fiscal limit of \$2 billion and modulation*

Development of ACIS legislation and supporting regulations occurred through a process of extensive consultation between Government and industry. In 1998, separate funding of \$1.3 billion for MVP's and \$0.7 billion for ACP's and other participants was proposed. This separate funding concept was subsequently abandoned by agreement, in favour of one total industry funds pool, limited to \$2 billion.

Since 1998, greater devolution of research and development responsibility by MVP's to ACP's has occurred in Australia in keeping with worldwide trends. There are many reasons for this trend, including recognition by MVP's that keeping pace with rapid technological change across all sectors of motor vehicle design, systems development and construction is becoming increasingly difficult, and that suppliers who specialise in their particular technology areas are better equipped to perform such tasks more cost effectively on behalf of MVP's.

Notwithstanding that the early concept for separate fund pools was discarded, the trend towards greater devolution of R&D responsibility to ACP's means that the original projection of ACP benefits from ACIS is no longer valid in today's circumstances.

Following the decision to adopt one total industry pool of funds, all ACIS participants are modulated at a uniform rate. This avoids the potential for funds to remain unallocated upon expiry of the Scheme in any one or more participant categories due to differing levels of performance.

*Rewarding R&D*

The structure of ACIS and the way in which it rewards R&D activity is critical to the component sector. By focusing assistance to the company actually performing the R&D work, the Scheme has assisted RBAU in being able to continue on its growth path. RBAU strongly encourages the Government to ensure this same principle is adopted in any successor scheme to current ACIS.

*The ways in which ACIS underpins RBAU's growth*

ACIS plays a pivotal role in the forward planning at RBAU. With the support provided by ACIS, RBAU will commit more than \$350 million on capital expenditure and research and development during the course of the Scheme.

There are a range of ways in which ACIS directly impacts on the project work that RBAU performs. This section considers the major R&D and product related projects with which RBAU is involved, and describes the impact that ACIS has had on them.

*Table 3 – Project-Specific ACIS impact*

<b>Project</b>	<b>ACIS Impact</b>
<i>Body electronics</i>	<i>ACIS enhances and sustains RBAU's global competitiveness and supports ongoing innovation.</i>
<i>Passive entry/passive go</i>	<i>The R&amp;D benefit enabled RBAU to commit to the high risk product development, with 6 years effort required prior to the first customer order being filled.</i>
<i>Vehicle Stabilisation (ABS, TCS, ESP)</i>	<i>The P&amp;E benefit assisted RBAU to secure the new plant &amp; equipment investments required for the next generation of product against global internal competition.</i>
<i>Mechatronics; Steering wheel angle sensors / Torque and angle sensors</i>	<i>R&amp;D and P&amp;E incentives made the RBAU bid competitive, and assisted in the company being given the status of global lead production plant within RB.</i>
<i>Diodes</i>	<i>ACIS assisted RBAU in establishing Australia's first large-scale silicon chip plant (which established self-sufficiency to support supply from Australia a major part of world requirements for power diodes).</i>

This table illustrates that there is a strong causal link between ACIS and RBAU's ability to:

- Initially win key projects;
- Ensure the continuity of these projects in Australia through successive generations of product development; and
- Enhance the features or technology of a product or process.

ACIS is critical to RBAU's continued success in securing and growing our capability to design and manufacture innovative automotive products.

The above illustrates the positive impacts of the ACIS program. If ACIS were scrapped, and the government relied on generally available assistance measures alone (such as the low tariff rate and the 125% tax concession), the consequences for RBAU would be severe.

#### *The impact of modulation*

Modulation affects RBAU's ability to commit to programs that would be considered higher risk. The impact of modulation at 0.75 reduces R&D research that RBAU can commit to by \$27 million over the life of the Scheme.

This discounting effect of modulation limits expenditure on new projects and now plant and equipment. It is however, accepted as an inherent mechanism in a financially capped scheme.



### **2.3 The role of the Automotive Tariff**

In today's global automotive industry, the Australian domestic market is too small to sustain an economic component manufacturing facility for Bosch products. On the other hand, Australia's remoteness from the major automotive markets of the world makes it uneconomical to locate a manufacturing facility here that produces solely for export. The domestic and export markets for RBAU are therefore interdependent. Industry policy must be sufficiently attractive to induce local manufacturing and research and development investments in support of domestic market requirements, thereby providing the base from which export business can be pursued to fill installed manufacturing capacity. In this context, the automotive tariff plays a significant role in each business case that RBAU puts to its German parent. It is therefore a crucial element of the on-going success of RBAU.

### **2.4 Decline in the Automotive Tariff Rate**

The reduction in automotive tariffs in Australia since 1982 has been enormous. The rate of 57.5% that prevailed in the early 1980s, compared with the planned rate of 10% in 2005 highlights the significance of the reduction.

While this has occurred in Australia, a number of countries have consistently sought extensions to scheduled automotive tariff reduction dates. In some cases, automotive tariffs have actually increased.

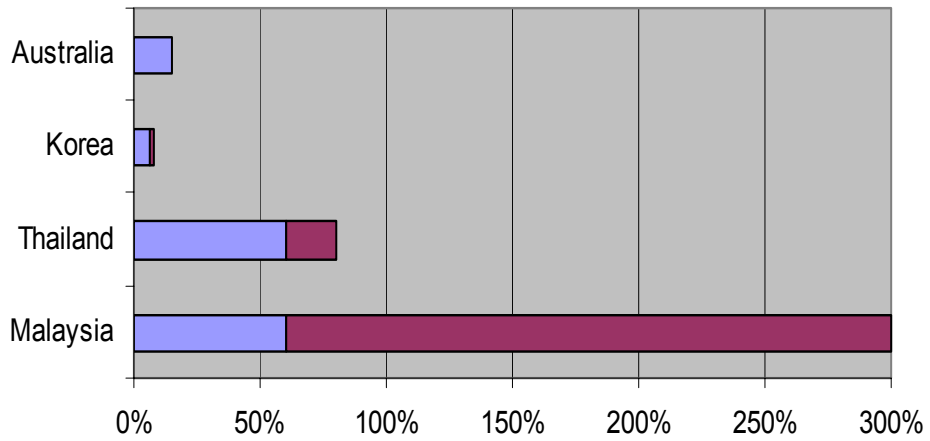
As an example, the Thai Government increased tariffs on passenger vehicles and automotive components substantially in the late 1990s, with some components' tariffs raised to 80%. During the same period, the average industrial tariff actually declined from 23 to 17%.<sup>6</sup>

---

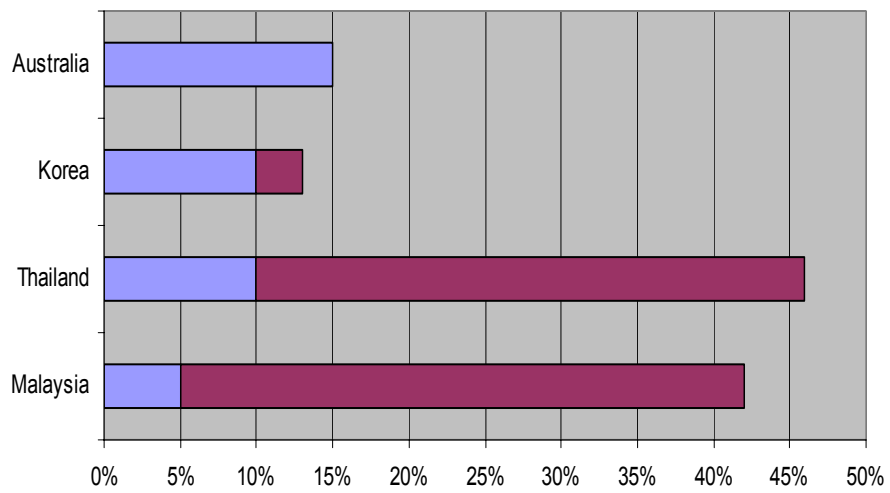
<sup>6</sup> "Australian Business Opportunities in Thailand", p. 43

Chart 7: Automotive Tariff Levels across selected countries, 2002 (red bars reflect a tariff range dependent upon individual products)<sup>7</sup>

### Vehicles



### Components



<sup>7</sup> Source: WTO, Apec, Economist Intelligence Unit

These movements shed a new light on the “level playing field” debate. In 1996 there may have been an arguable case to say that, despite relatively high automotive tariffs at that time, a number of countries had commitments in place to reduce tariffs. A growing body of empirical evidence is emerging that suggests this disparity is actually growing.

Australia’s 10% rate in 2005 is extremely low compared with historical duty rates for automotive products and provides little protection for the domestic automotive industry from offshore competition. In many countries in which Australian companies are trying to develop markets for automotive products, duty rates are significantly higher (e.g. ASEAN countries, and the USA tariff of 25% on light commercial vehicles that account for around 60% of vehicle production). If the domestic industry is to remain competitive in a global marketplace, international tariff rates must be taken into consideration when establishing future rates in Australia.

## **2.5 Overseas Market Access Issues**

One element critical to the on-going success of RBAU is the broad issue of market access to our current or potential trading partners.

While the Government committed itself to opening up automotive markets as part of the 1997 package, despite its best efforts little headway has been made.

### *Free Trade Agreements*

RBAU supports efforts by the Australian Government to pursue bilateral free trade agreements with countries where Australia has a trade deficit in automotive goods (e.g. Thailand). RBAU proposes that close consultation between Government and industry should be maintained via the Automotive Council on the advisability of, and progress towards, free trade agreements with other countries (e.g. the United States).

### *Automotive Market Access and Development Strategy*

The additional measures that were established through the 1997 package of announcements included initiatives intended to enhance the access afforded to the Australian automotive industry in key markets. RBAU believes that these measures have had only modest impact. RBAU supports further consideration of alternative market development measures through the Automotive Council.

## **2.6 Other reforms**

### *A holistic public policy approach*

RBAU wishes to encourage the government to take a holistic approach to the public policy settings applicable to the automotive industry.

The company has considered how it is impacted by a range of policy measures including:

- State and Federal taxes and charges;
- Infrastructure and telecommunications costs;
- Utility costs;
- Freight and transport costs and efficiencies; and
- The labour market and industrial relations system.

### *State and Federal Taxes and Charges*

Despite the Government's forecast savings to the manufacturing industry of more than 3% through the advent of the New Tax System, RBAU achieved no cost savings.

In regard to other government taxes and charges, the two that offer some scope for reduction are the corporate tax rate and state-based payroll tax. However, even if payroll tax was abolished, this still would not begin to approximate the benefits that RBAU receives through ACIS.

Additionally, we are strongly of the view that the targeted nature of the ACIS program, and the specific incentives it provides to the automotive industry to

become more innovative would not be achieved through alteration to other generic government taxes.

*Infrastructure and telecommunications costs*

RBAU considers these costs to be comparable to those in competitor locations.

*Utility costs*

RBAU believes our utility costs are comparable to competitor locations, this has come at some cost to the company in the area of electricity supply.

*Freight costs*

Being a substantial exporter of high value-add product, freight costs represent a substantial impost to RBAU.

RBAU utilises airfreight for the majority of its export activity. The current lack of capacity and resulting cost impacts to and from Australia has become a key issue.

*The labour market and industrial relations system*

There are some operating fundamentals within the automotive components industry that can make it vulnerable. These are associated with the just-in-time nature of the automotive supply chain, and the ability of the smallest component manufacturer to stop a vehicle assembler production line. This occurs at great cost to the industry and causes incalculable damage to Australia's reputation overseas.

RBAU believes it is imperative that all stakeholders in the industrial relations process including government, firms and unions, have regard to the unique nature of this industry and work together with the utmost urgency to improve the labour market and industrial relations system.

### *Key Themes*

*The structure of ACIS, and relationship between the treatment of MVPs and ACPs is vital to ensuring that benefits are equitably shared across the industry.*

*In this manner, the ACIS program is an effective tool to induce the Australian industry to invest in its future. RBAU has ensured that its ACIS benefits have been utilised to reinforce and grow its global position.*

*Australia has seen a substantial decrease in automotive tariff protection since the early 1980s, much of which has been undertaken in isolation from trading partners and other countries competing for global automotive investment.*

*Planned 2005 tariff of 10% on most automotive components is comparable to many other countries and is vital to assist investment for local manufacturing.*

*While the effectiveness of the Government's attempts to open markets for Australian automotive product has been minimal, these efforts must continue and be resourced and refocused.*

*There is little scope for delivering savings to RBAU or the broader automotive manufacturing industry through microeconomic reform. The one exception here being airfreight, which requires scrutiny from Government as a range of factors are significantly increasing its cost to Australian companies.*

*Governments, industry and unions must resolve industrial relations issues that have lead to repeated supply disruption and adopt more stringent measures in a cooperative manner to avoid reoccurrence.*

## SECTION 3 – RECOMMENDATIONS

### ***Recommendation 1.***

*That the current assistance arrangements through the Automotive Competitiveness and Investment Scheme be continued along similar lines for the period 2006 to 2010, at funding levels not below the current scheme in proportional terms.*

### ***Recommendation 2.***

*That the Federal Government maintains tariffs on passenger motor vehicles and automotive components at 10% beyond 2005. Reduction in Australia's automotive tariff rates should only occur if industrialised countries commit to Free for all automotive products and non-industrialised countries commit to significant reductions in their automotive tariff and non-tariff barriers.*

### ***Recommendation 3.***

*That the Government, in consultation with the industry through the Automotive Council, pursue:*

- *Free Trade Agreements with countries where Australia has a significant automotive trade deficit (e.g. Thailand); and*
- *Export market development initiatives for the local industry.*

### ***Recommendation 4.***

*That, as a matter of urgency, the government initiates a dialogue between all relevant stakeholders in the industrial relations process aimed at securing stability and continuity of supply of automotive products to Australian and overseas customers.*

## APPENDIX A - KEY HISTORICAL MILESTONES FOR BOSCH IN AUSTRALIA

- 1905 *First Bosch products imported into Australia*
- 1922 *Robert Bosch Supply and Service Company founded*
- 1954 *Robert Bosch Australia Pty Ltd founded and building commenced at Clayton, Victoria plant*
- 1958 *Commenced local manufacture of a wide range of Automotive products & marketing of consumer goods in Australia*
- 1990
- 1992 *Commenced manufacture of Body Computer ECU's and Vehicle Security Systems*
- 1993 *Appointed the World Centre of Competence within the Bosch Group for Electronic Vehicle Security Systems*
- 1995 *Commenced manufacture of ABS. Named Victorian employer of the Year*
- 1996 *Awarded global responsibility for development and manufacture of Onboard Electronics for the Bosch Group*
- 1998 *Named amongst the 10 most innovative companies in Australia by the Business Review Weekly magazine*
- 1999 *Awarded Victorian Exporter of the Year, Large Advanced Manufacturer Award and Australian Exporter of the Year*
- 2000 *Commenced Australia's first large scale manufacture of Silicon Chips, Awarded Large Advanced Manufacturer Award and Named to BRW Top 10 Most Innovative Companies*
- 2001 *Awarded Automotive Engineering Excellence Silver Award and Large Advanced Manufacturer Award*
- 2002 *Introduction of Comfort Entry/Comfort Go passive entry system for passenger vehicles*

### *Bosch worldwide:*

- 1886 *Opening of the "Workshop for precision and electrical engineering" in Stuttgart*
- 1887 *Construction of first Low-voltage magneto for vehicles*
- 1898 *Opening of Bosch's first foreign subsidiary (London)*
- 1902 *Development of first high voltage magneto*
- 1927 *Series production of first fuel injection pumps for diesel engines*
- 1951 *Development of gasoline fuel-injection pump for two stroke motor vehicle engines*
- 1967 *Introduction of first electronically controlled gasoline fuel-injection system (Jetronic) worldwide*
- 1976 *Commenced production of the Lambda oxygen sensor*
- 1978 *Introduced the first Anti-lock Braking System (ABS) worldwide*
- 1979 *Start-up of production of first system for electronic control of ignition and injection (Motronic) introduced in the BMW732i*
- 1986 *Start up of series production of Traction Control (ASR)*
- 1991 *Commenced large scale production of the compact alternator*
- 1992 *Introduced first electronically controlled commercial vehicle braking system (ELB)*



- 1995 Introduced the Electronic Stability Program for vehicles (ESP)*
- 1997 Start-up production of high pressure diesel injection system "Common Rail"*
- 1998 Commenced production of diesel direct injection Unit Injector System (UIS)*
- 2000 Introduction of Adaptive Cruise Control (ACC); Gasoline Direct Injection*
- 2001 Start up of production of electrohydraulic braking system*

## APPENDIX B – INFLUENCES ON DOMESTIC DEMAND AND THEIR LIKELY IMPACT<sup>8</sup>

<b>Factor</b>	<b>Status</b>	<b>Likely impact</b>
Tariffs	<ul style="list-style-type: none"> <li>• <i>Tariffs on PMVs at 15% to end 2004</i></li> <li>• <i>10% from 2005</i></li> <li>• <i>Unknown beyond 2005</i></li> </ul>	<p>After 2005, there is a high degree of uncertainty regarding future tariffs, however one possible scenario is for tariffs to continue decreasing to 5% or what is deemed by the WTO as “Free Trade.” To ensure global car manufacturers continue their investment in the Australian industry, tariffs must remain favorable and as such, continually declining tariffs may have an adverse impact on domestic OEMs.</p>
ACIS	<ul style="list-style-type: none"> <li>• <i>Provides A\$2 billion in assistance to 2005</i></li> <li>• <i>Unplanned beyond 2005</i></li> </ul>	<p>The ACIS program to date has encouraged spending on research and development in Australia. Without an assistance program, it is likely many research dollars would go offshore, reducing the level of investments made in the Australian automotive industry.</p>
Taxation	<ul style="list-style-type: none"> <li>• <i>Introduction of GST has been largely favourable to auto industry although luxury taxes remain</i></li> <li>• <i>FBT continually under attack as concessionary</i></li> <li>• <i>Complexity and uncertainty regarding potential applications of fuel and excise taxes</i></li> </ul>	<p>It is unlikely luxury taxes will disappear and as pressure continues in relation to FBT, increases in relation to FBT on vehicles may be seen. Currently Australia’s fuel taxes are relatively low as compared to the rest of the global marketplace the USA accepted. Higher petroleum based fuel taxation may be introduced to encourage usage of alternate/greenhouse friendly fuels as part of efforts to achieve emission reductions.</p>
Environment	<ul style="list-style-type: none"> <li>• <i>Possibly the biggest policy challenge facing the automotive industry</i></li> </ul>	<p>Efforts to comply with increasingly stringent environmental regulations may see negative impacts in cost competitiveness, increased fuel taxes as discussed above and increased investment cost to comply with little knock-on benefits to production.</p>
Government purchasing	<ul style="list-style-type: none"> <li>• <i>Large purchasers of new vehicles</i></li> </ul>	<p>It is unlikely governments would shift from buying predominantly locally manufactured vehicles, however, due to the substantial volumes of government vehicle purchases, any change in government purchasing policy would have a significant and largely transparent effect on the Australian automotive industry.</p>

<sup>8</sup> Source: The Allen Consulting Group, “Automotive Industry – Strategic Issues Mapping Study”, 2001

Factor	Status	Likely impact
Workplace and IR	<ul style="list-style-type: none"> <li>• <i>Consistent with much of the rest of the world, the Australian automotive industry is highly unionised and heavily influenced by industrial relations systems</i></li> </ul>	Global car manufacturers will continue seeking to influence the industrial relations systems in Australia in order to ensure best practice manufacturing facilities and performance are available. Ability to meet the expectations of these global car manufacturers will enable the Australian automotive industry to increase exports.
International trade	<ul style="list-style-type: none"> <li>• <i>Key factor influencing planning of future assistance programs (eg, what's beyond ACIS?)</i></li> </ul>	The Australian governments commitment to the APEC Bogor Declaration will have significant influence over any future automotive industry policy decisions including tariff reductions and investment schemes.
Infrastructure	<ul style="list-style-type: none"> <li>• <i>The state of the country's infrastructure is of major importance to the automotive industry in terms of manufacturing and logistics requirements</i></li> </ul>	Investments in infrastructure and microeconomic reform in general can be expected to have a positive impact on the automotive industry pricing structure.
Transport policy	<ul style="list-style-type: none"> <li>• <i>Microeconomic reform has been beneficial to the industry, however has slowed in recent years</i></li> </ul>	User pay systems are likely to become mechanisms for financing investment in infrastructure (e.g., fuel and excise taxes).
Safety	<ul style="list-style-type: none"> <li>• <i>OEMs working to improve safety of vehicles</i></li> <li>• <i>State governments reviewing roadworthiness matters</i></li> </ul>	Differenced between Australian Design Requirements and international standards may be costly for local manufacturers seeking to increase exports as well as for those seeking to import from countries with less stringent requirements. Significant investment and research and development may be required to gain uniformity of standards.
State taxes	<ul style="list-style-type: none"> <li>• <i>Payroll tax under pressure to remain competitive</i></li> <li>• <i>Stamp duty and registration represent fees significant to vehicles</i></li> </ul>	Dependent of the success of the new federal tax system (GST), state taxes may undergo significant changes in the future. Further reductions of state taxes would be expected to have a favourable effect on the automotive industry.

## APPENDIX C – METHODOLOGY & ASSUMPTIONS

### Methodology

#### *Conceptual Framework*

The economic value of RBAU's business consists of both *quantifiable* and *unquantifiable* elements. The quantifiable economic value can be further segmented into *direct* expenditure and the *indirect* economic activity generated by that expenditure. While the direct and indirect effects are calculated separately, they are ultimately combined to give a single economic value. The unquantifiable effects are presented and discussed separately.

#### *Direct Benefits*

Identifying the direct economic benefits deriving from RBAU's total business activities is relatively straightforward as these are essentially the economic activities directly related to RBAU's total expenditures. The expenditures are broken down into:

- Operating expenses (including materials and overheads);
- Labour (wages and salaries);
- Taxes; and
- Capital expenditure.

Each item of expenditure, listed above, is then allocated directly across the 35 Australian New Zealand Standard Industrial Classification (ANZSIC) industry categories.

That proportion of business expenditure which is directly induced by ACIS is estimated using RBAU's responses to an ACIS survey distributed to all ACIS recipients. RBAU was required to estimate what their expenditures would have been if ACIS did not exist. The ensuing difference between actual expenditure levels and the hypothetical estimate is then taken as ACIS-induced expenditure for each of the items listed above and allocated across ANZSIC categories using the same method as for the whole of business expenditures.

More specifically, for total expenditure on wages and salaries, the amounts are

---

allocated across the appropriate ANZSIC categories using the ABS *Household Expenditure Survey 1998-99* (Catalogue No. 6535). This is based on the assumption that all of the wages received by households will be spent in certain ANZSIC categories.

Similarly, taxes are allocated across the relevant ANZSIC industries using the breakdown of total government expenditure as reported in the ABS *Government Finance Statistics 2000-01* (Catalogue No. 5512).

#### *Indirect Benefits and Input-Output Analysis*

Quantifying the indirect benefits requires a more detailed analysis of the direct expenditure items. The indirect economic benefit refers to the financial transactions generated as a result of the direct expenditure associated with RBAU's business activities. Indirect impacts are largely the flow-on demand created for other goods and services in the economy. Calculation of the indirect benefit requires use of the input-output methodology. The approach to this part of the analysis is best illustrated by example.

***The expenditure on plant and equipment would constitute part of the direct contribution. In turn, the providers of the specific piece of equipment will use that expenditure to purchase the inputs to providing that equipment (machinery, metals, tools, etc.). These purchases, in turn, create a demand for inputs into the production process of the suppliers of machinery, tools etc. Thus, a flow-on effect, termed the production-induced effect, is created throughout the economy by the initial expenditure on an item of equipment. In addition to this, the wages component in the inputs used for the equipment are used for immediate consumption in other sectors or alternatively saved, thus generating investment throughout the Australian economy. This process is known as the consumption-induced effect.***

The total indirect economic contribution is measured using input-output tables that explain the inter-relationships between the different sectors of an economy. Input-output analysis involves calculating the economic impact that one sector of the economy has on other sectors of the economy using flow tables – the tables for

Australia are produced by the ABS. Flow tables measure supply and demand linkages between all industries in the economy by recording the industry destination for outputs and the industry sources for intermediate inputs. These flow tables also enable estimation of multipliers that can be applied to the direct economic expenditure of a business or event in order to estimate the total indirect economic expenditure associated with that business or event.

The input-output analysis has been performed for RBAU's whole of business operations and those activities that are considered to be induced by ACIS.

#### *Data sources*

Information on the annual expenditure levels for year ended 31 December 2001 for RBAU was collected from the company. RBAU also provided the information on the ACIS-induced effects via completion of the ACIS survey.

The Australian Bureau of Statistics (ABS) *Household Expenditure Survey 1998-99* (Cat No. 6536) was used to allocated wages and salaries into the relevant ANZSIC categories). Similarly the ABS *Government Finance Statistics 2000-01* (Cat No. 5510) was used to allocated taxes into the relevant ANZSIC categories.

The indirect effects are calculated by applying the relevant 'production-induced effect' and 'consumption-induced effect' multipliers to the expenditure in each industry. The multipliers are obtained from Table 15 of the publication *Australia Input-Output Tables 1996-97*, ABS Catalogue No. 5209.0. The large amount of data required and the complexity of tabulating flows between sectors result in a substantial lag between the reference period and the date the input-output tables are published. The 1996-97 input-output tables are the most recent available and were released in March, 2001. The methodology employed to calculate the multipliers used in this report is detailed in the publication *Introduction to Input-Output Multipliers* (ABS Catalogue No. 5246.0).